Job Insecurity and Health in the United States

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10 March 2006

Total Word Count: 12,418

Running Head: Job Insecurity and Health

CONFERENCE DRAFT: PLEASE DO NOT CITE OR QUOTE

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*Acknowledgement of Grant Support: Burgard and Brand were both supported by the Robert Wood Johnson Health & Society Scholars Program. This research uses data from the Americans' Changing Lives Study (ACL), which has been supported by grants from the National Institute on Aging (PO1 AG05561 and R01 AG018418) and Robert Wood Johnson Foundation Investigators in Health Policy Research Program (030987), which have also supported House's involvement with this paper.

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ABSTRACT

Recent changes in the labor market have increased the perception that relationships between employers and employees are less secure than in the past. This study examines the potential consequences of a rising sense of job insecurity for the health of U.S. workers. Using a nationally-representative longitudinal sample, we construct brief histories of perceived job insecurity from two measures of respondents' fears about job loss collected three years apart. Our findings suggest that chronic fears about the likelihood of losing one's job are associated with poorer self-rated health and greater depressive symptoms, even after adjustments for sociodemographic characteristics of workers and their experiences of actual involuntary job losses or negative health shocks. The results also suggest that perceived insecurity may have stronger effects on self rated health among private sector employees as compared to their public sector counterparts, and greater impact on depressive symptoms among black workers as compared with their non-black counterparts.

INTRODUCTION

In the last several decades the labor market has undergone dramatic changes in most industrialized western countries. Economic recessions, the industrial shift from manufacturing toward service, and rising global competition have all contributed to the dramatic restructuring organizations have engaged in to enhance flexibility and competitiveness (Howard 1995). This restructuring has led to large-scale reductions of permanent employees through layoffs or plant closings, and the substitution of involuntary part-time jobs or fixed-term contracts for permanent, full-time jobs (Kalleberg 2000). A critical outcome of these shifts in the way work is organized is a rising sense that the employment relationship has become less secure (Cappelli et al. 1997). This growing sense of insecurity could threaten the health of American workers; evidence for a relationship between job insecurity and health has begun to accumulate, both from studies of plant closures, which focus on the health of people who know that they are going to lose their jobs (e.g., Heaney, Israel and House 1994; Mattiasson et al. 1990), and from studies that examine the consequences of self-reports of perceived job insecurity in population samples (e.g. Ferrie et al. 2002; Pelfrene et al. 2003). Much of the empirical evidence for an impact of job insecurity has shown its negative effects on mental health and well-being (De Witte 1999; Dekker and Schaufeli 1995; Ferrie et al. 1998). Fewer studies have examined physical health differences, but the evidence suggests damaging effects on overall self-rated health or morbidity (Ferrie et al. 1995; Kasl, Cobb and Gore 1972; Pelfrene et al. 2003), physical symptoms (Ferrie et al. 1998; Heaney, Israel and House 1994), and cardiovascular risk factors (Arnetz et al. 1991; Ferrie et al. 2001; Kasl and Cobb 1970; Siegrist et al. 1988). Consensus on the negative health effects of job insecurity has not been reached, particularly for physical health outcomes (Iversen, Sabroe and

Damsgaard 1989; Kasl and Cobb 1968; Kasl, Gore and Cobb 1975; Mattiasson et al. 1990).[1] Nonetheless, the evidence suggests that contemporary threats to job security could have significant negative implications for the well-being of American workers.

However, these dismal predictions have been challenged by recent economic research suggesting that the threat of job insecurity hasn't dramatically changed over the past several decades. Focusing largely on job tenure, this work has shown that the average amount of time workers spend with an employer has not decreased substantially since the 1970s (Neumark 2000; Stevens 2005). Thought there are indications that job turnover increased over this same period among some worker groups (Bernhardt et al. 2000; Jaeger and Stevens 2000), and that involuntary job losses rose in the 1970s and 1980s (Valetta 2000), the general conclusion of these economic analyses is that claims for declining job security are exaggerated. Such conclusions suggest that changing labor market opportunities and the movement toward greater contingency in employment relationships aren't likely to have an effect on worker health, at least not through a rising sense of job insecurity.

The conflict that exists between sociological and economic perspectives on job insecurity is driven at least in part by differences in the way job insecurity has been defined and measured. Economists have studied "objective" measures of job insecurity, such as the average length of job tenure or the likelihood or economic consequences of actual involuntary job loss. Objective

[1] These discrepant results may exist because nearly all of studies examining physical health compare a group threatened with or actually experiencing downsizing or plant closure with other groups that are not threatened, rather than basing exposure on individuals' reports of their perceived job insecurity. As discussed above, it may be individual perception of job insecurity that is most critical for health.

measures show relatively low levels of unemployment and stable average job tenure in the past several decades. However, economists have noted that there has been some increase in the incidence of involuntary job loss independent of the business cycle (Hammermesh 1989; Keltzer 1998). Moreover, there is evidence that involuntary job losses are economically costly. Economists have tended to focus on job displacement, involuntary job losses that result when firms downsize, restructure, close plants or relocate, or layoffs from which the worker was not recalled. Job displacement has been linked with a substantial period of non-employment (Farber 2003; Kletzer 1989; Podgursky and Swaim 1987; Ruhm 1991; Seitchik 1991), a major loss of income and increased financial strain (Hammermesh 1989; Jacobson, LaLonde and Sullivan 1993; Podgursky and Swaim 1987; Ruhm 1991; Seitchik 1991), and reduced job quality when reemployed (Brand 2004). These consequences appear to have lasting effects on long-term earning potential (Brand 2004; Jacobson, LaLonde and Sullivan 1993; Podgursky and Swaim 1987; Ruhm 1991; Seitchik 1991), and may also have consequences for both health-related and non-wage economic benefits derived from employment, such as health insurance coverage, pension and other benefits (Brand 2004; Podgursky and Swaim 1987).

Given this evidence for substantial economic consequences of job displacement, it would appear that fears about job loss are a reasonable response to uncertain economic conditions. Furthermore, there is considerable evidence that working-age people who are or have become unemployed report significantly poorer health than their counterparts who are working for pay (see Dooley, Fielding and Levi 1996 for a review). While studies of job loss and unemployment have provided convincing evidence of negative consequences for socioeconomic standing and health, such studies only capture the experiences of the relative minority of individuals who are or become unemployed. Given the massive restructuring of work occurring in the United States

and other nations, many more workers may be vulnerable to negative consequences if perceptions of job insecurity are hazardous to health. For this reason, sociologists and epidemiologists have examined individuals' perceptions of their job security and their psychological or physiological response to the threat of job loss. Even net of an actual job loss, these feelings of insecurity could have an important influence on health.

Perceived job insecurity may also be a more sensitive indictor of individuals' response to both objective threats and their own capacity to deal with uncertainty than more "objective" measures of job insecurity such as average job tenure. There is evidence that people respond realistically to objective macroeconomic conditions in formulating their beliefs about their job insecurity (Catalano, Rook and Dooley 1986), but an individual's subjective appraisal of risk is also a vital component of the experienced intensity of threat. An analysis of using the General Social Survey from 1977-1996 concludes that American workers' self reported fears about job loss were greater in the recession of the early 1990s than in more objectively severe recession of the early 1980s, but this greater perceived insecurity was consistent with trends in the frequency and costliness of involuntary job loss, both of which were higher in the more recent recession and recovery years (Schmidt 1999). So while perceptions of job insecurity thus reflect real macroeconomic pressures, they also reveal personal interpretations of an individual's work environment (Klandermans and Van Vuuren 1999). Even given the same objective employment conditions, the feeling of job insecurity may vary from one individual to another (Greenhalgh and Rosenblatt 1984; Hartley et al. 1991). While many workers lack the necessary resources to comfortably sustain themselves in the event of a job loss, some fraction of workers are likely to benefit from the increased mobility made possible by a more flexible work environment. Thus, individual variation in appraisal of both the risk of involuntary job loss and any resultant

negative health consequences make perceived job insecurity a sensitive indicator of the interaction of individuals with their opportunity structures.

In this study we focus on the relationship between individuals' perceptions of their own job insecurity and their health. Using nationally-representative longitudinal data, this study builds on the previous literature by considering the possible impact of health-based selection into insecure work, the contribution of subsequent involuntary job loss and other negative life events that occur previous or subsequent to our measures of perceived job insecurity, personality as a potential determinant of both perceived job insecurity and reports about health, and the differential effects of perceived job insecurity across population groups.

BACKGROUND

How Does Job Insecurity affect Health?

Sociologists have long been interested in the relationship between work and well-being. Focusing on the interaction between work characteristics and personality, Kohn and Schooler and their colleagues found that job conditions facilitating occupational self-direction are conducive to effective intellectual functioning and an open and flexible orientation to others, while job conditions that constrain opportunities for self-direction or subject the worker to several types of pressures or uncertainties result in less effective intellectual functioning, poorer evaluations of self, and an intolerant social orientation (Kohn and Schooler 1982; Miller et al. 1979). Based on Kohn and Schooler's line of research, "good" jobs could have positive effects on worker's psychological functioning, and feeling insecure about keeping a good job could represent a threat to workers' well being. More recently, Kalleberg and colleagues have investigated the increasing use of nonstandard employment relationships by employers and find that workers in nonstandard jobs are at higher risk of being exposed to "bad" job characteristics

such as low pay and no access to health insurance or pension benefits than workers in conventional jobs (Kalleberg, Reskin and Hudson 2000). While Kalleberg and his colleagues don't investigate the consequences of such job features for health, these characteristics could act as mechanisms to connect job insecurity, a feature of many nonstandard employment relationships, with poorer health.

Theoretical work on the consequences of stress for well-being is fundamental to research on job insecurity and health. A central proposition of stress research is that anticipation of a stressful event represents an equally important, or even greater, source of anxiety than the actual event itself (Lazarus and Folkman 1984). The experience of being insecurely employed may cause stress because of the mental strain associated with being in a powerless position, and anticipation about the problems of job loss and ambiguity about what the future holds and what responses would be most therapeutic (Heaney, Israel and House 1994; Joelson and Wahlquist 1987). There is evidence that the effect of negative stimuli is mediated by a person's perception of the predictability and control of such stimuli (Dohrenwend and Dohrenwend 1974; Glass and Singer 1972; Seligman 1975), and perceived job insecurity is a condition defined by feelings of inability to control the stability of one's employment. Workers who experience prolonged and intense levels of job insecurity could experience negative health consequences because the stress response causes the release of hormones that affect many organ systems (Gazzanizga and Heatherton 2003). Research suggests that the effects of constant stressors and intense stressful events accumulate to impair the function of the immune system, increasing the likelihood and severity of illness (Cohen et al. 1998; McEwen 2002).[2]

[2] Theoretically, behavioral change instigated by the stress of job insecurity could be an important mechanism explaining health decline, but there is little empirical evidence of changes

While there is sufficient evidence to regard perceived job insecurity as a plausible risk factor for health decline, existing studies have had difficulty providing convincing evidence for the relationship for several reasons, including measurement and selection issues, issues of exposure duration, the potential for reverse causation, and lack of control for subsequent employment events. A key measurement issue is that perceived job insecurity is a subjectively-reported state, and in analyses that also use respondents' subjective reports of their health, results may be vulnerable to bias if negative affectivity, an underlying personality construct, influences reports of both predictor and outcome (Brief et al. 1988). Negative affectivity is the term used to describe a focus on the negative aspects of oneself, other people, and the world in general (Watson and Clark 1984). Some studies that have adjusted for negative affectivity have eliminated correlations between stressors and outcomes (Brief et al. 1988), and many studies have not controlled for personality characteristics, so in the present analysis we include an indicator of negative affectivity to ascertain its effect.

It is also important to consider the non-random sorting of workers into jobs; it may be true that the characteristics that would restrict some individuals to job characterized by high levels of insecurity, such as low levels of education, also predispose them to poor health. In this analysis we examine the impact of adjusting for workers' sociodemographic characteristics to see whether such differences explain the poorer health of insecure workers. In addition, we explore the importance of adjusting for job characteristics related to those examined in the work on "bad jobs" by Kalleberg and colleagues (2000). Workers who perceive their positions as insecure may be more likely to work in lower-wage jobs, the private sector, or blue collar

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in tobacco or alcohol use resulting from exposure to job insecurity (Jenkins et al. 1982; Mattiasson et al. 1990).

positions, or may be less satisfied with their jobs, all features that could provide an underlying explanation for a relationship between perceived insecurity and health.

In addition, many of the existing studies of job insecurity and health are cross-sectional and cannot address the possibility of reverse causation; people who have health problems might be more likely to feel worried about their job security, whether because they believe they won't be able to continue to perform their duties, they fear discrimination from their employer, or for other reasons. There is some evidence that poor health increases the odds of insecure employment (Hartley et al. 1991), but another study found that health is not a strong predictor of perceived job insecurity (Heaney, Israel and House 1994). Longitudinal data with sequential measures of health, the type used in the present analysis, can assist in untangling these associations.

There is also limited understanding of the necessary period of exposure to job insecurity before which we might expect to observe health consequences. Heaney and colleagues (1994, p. 1432) propose that in the short term, responses to the stress of job insecurity could be emotional (anxiety, tension, dissatisfaction), physiological (elevated health rate, increased catecholamine secretion) and behavioral (drug use, absenteeism, lack of concentration), while in the longer term, the accumulation of these responses could result in adverse consequences for physical health. Though few in number, some studies have found that chronic exposure to job insecurity is more hazardous than intermittent exposure (Ferrie et al. 2002; Heaney, Israel and House 1994). On the other hand, there is limited evidence that the effects of job insecurity on mental health may decay over time under some circumstances (Dekker and Schaufeli 1995), but relatively little is conclusively known about the time period over which it exerts its effects, or the importance of chronic versus acute exposure. In the present study, we begin to address the issue

of duration of exposure by examining change and stability in perceived job insecurity, using two measures of perceived insecurity that were gathered three years apart.

Finally, job insecurity may also only appear to have a negative impact on health if people who feel that their jobs are insecure are more likely to experience an actual involuntary job loss, because job loss has been shown to negatively impact health (Dooley, Fielding and Levi 1996). We have found no previous studies that assess perceived job insecurity and adjust for subsequent involuntary job losses over follow-up, the strategy we follow in the present study.

In the analysis that follows, we explore several research questions designed to address gaps in the existing literature: (1) *Does perceived job insecurity predict health? Is the relationship robust to adjustment for characteristics that predict insecurity*? This analysis considers two self reported measures of health and adjusts for the factors that predict job insecurity, with careful attention to the potential for health selection. (2) *Is the relationship between job insecurity and health explained by actual job losses or health events?* We consider the impact of involuntary job losses and acute negative health events as potential predictors of job insecurity or of changes in perceived insecurity that may account for observed health effects. (3) *Is the relationship between perceived job insecurity and health the same for all workers?* We explore whether there are differences by sex, race, educational attainment, "good" and "bad" job characteristics, or by the experience of negative employment or health events in the relationship between perceived insecurity and health.

DATA AND METHODS

Data

The American's Changing Lives study (ACL) is a longitudinal cohort comprised of a stratified, multi-stage area probability sample of non-institutionalized adults 25 years and older living in

the United States in 1986, with oversampling of adults 60 and older and of African Americans. Weights have been designed to make ACL respondents representative of the non-institutionalized population in the contiguous United States in 1986. In the baseline survey in 1986, face-to-face interviews were conducted with 3,617 men and women (representing 70% of sampled households and 68% of sampled individuals), and these individuals were followed up with subsequent waves of data collection in 1989 (83% of survivors), 1994 (83% of survivors) and 2001/2 (76-80% of survivors). In the present analysis we focus mainly on the 1,111 individuals who were working in both 1986 and 1989, and who were under the age of 60 at baseline. This restricts our sample to respondents who were not likely to be beyond retirement age during observation, and to those for whom we are able to assess change in perceived insecurity over time. Below, we discuss the possible impact of excluding individuals who were working only in one of the two first waves. In 1986 and 1989, respondents were asked about their perceived job insecurity and at each wave of data collection, respondents reported on their current health and the occurrence and timing of involuntary job losses and serious health events in the several years prior to interview. Further information about the longitudinal study design for the ACL can be found elsewhere (House et al. 1990; House, Lantz and Herd forthcoming; House et al. 1994).

Analytic Strategy

All analyses are conducted with Stata software version 8.0 SE. We use sample weights constructed to adjust estimates for sample attrition and death between the first two survey waves.[3] Descriptive characteristics of the sample are presented and differences across categories

[3] We restrict our analytic sample to those respondents who were working in both 1986 and 1989, and all measurements used in this analysis were taken in those two survey waves, so we don't

of perceived insecurity experience are tested with Kruskal-Wallis or Chi-square tests for difference. To predict health outcomes we estimate linear regression models of self rated health and depressive symptoms.[4] We also conduct analyses that examine interactions between perceived insecurity and key predictor variables. These additional analyses address differences in the relationship between job insecurity and health on the basis of stratifying factors identified in previous research. For example, studies of white collar civil servants in the United Kingdom have suggested that the effects of job insecurity on physical health may be stronger in men than women (Ferrie et al. 1995; Ferrie et al. 1998), while a population-based sample of Canadians (more similar to the sample considered in the present analysis) did not show gender differentials in the relationship between job insecurity and health (McDonough 2000).

Measures

Table 1 presents means and standard deviations, or percentages where appropriate, for all measures used in the analysis. Figures are reported separately by category of perceived insecurity (described below). Significance levels indicated by p-values for Kruskal-Wallis or Chi-square tests for difference across categories of perceived insecurity are indicated in the final column,

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include anyone at risk of leaving the survey. However, weights address the representativeness of the respondents we consider by adjusting for the attrition through non-response and death in the entire ACL sample. Furthermore, we consider in detail the consequences of selecting our analytic sample in this way in Appendix A and the discussion below.

[4] We also tested ordered logistic regression models for self-rated health, and found that the results were even stronger, but substantively equivalent to the results from linear regression models. For ease of presentation and comparison with the results for depressive symptoms, we present linear regression results here.

with "Secure in 1986 and 1989" as the comparison category. Most predictor variables were collected at baseline in 1986, while health outcome measures and measures of involuntary job losses and health shocks occurring between 1986 and 1989 were collected in 1989. All figures presented in Table 1 are weighted estimates, while column totals are not weighted.

Measure of Perceived Insecurity

Respondents who were working for pay in 1986 and 1989 were asked at each of these interviews "*How likely is it that during the next couple of years you will involuntarily lose your main job -- not at all likely, not too likely, somewhat likely, or very likely*?" The response to this question was dichotomized to create a measure of perceived job insecurity, with response categories of 0 = secure (not at all/not too likely to lose job) and 1 = insecure (somewhat/very likely to lose job).[5] Using information from both the first and second survey waves, we created an indicator of accumulation and change in perceived job insecurity: (1) Secure in 1986 and 1989, presumably the least hazardous condition (N=791), (2) Insecure in 1986, but secure in 1989 (N=143), (3) Secure in 1986 but insecure in 1989 (N=105) , and (4) Chronically insecure both in 1986 and 1989, presumably the most hazardous condition (N=72).

Health Outcomes

[5] Five respondents reported "don't know" in answer to one of the insecurity questions and we assigned them to the "not insecure" category. The same general strategy was followed for predictor variables: those reporting "don't know" or who were missing answers to questions about, for example, occupation, were assigned to the less 'negative' category of that variable. In the case of occupation, respondents missing information were assigned to the "white collar" category because we hypothesize that blue collar jobs are less secure than others. The number of respondents missing information on any predictor variable is small.

Two health measures are used to examine whether our measure of perceived job insecurity has similar effects across outcomes: self rated health and depressive symptoms. Our outcome measures of health were obtained in 1989, about three years after a respondent first reported about perceived insecurity and in the same wave as the second report of perceived insecurity. Health measures are also available in 1994 and in 2001, but we do not have information about perceived job insecurity after 1989. Since we are unable to observe whether perceived insecurity changed between 1989 and these later two waves, it would be difficult to interpret the lagged effects of insecurity in 1986 and 1989 without understanding the contemporaneous insecurity conditions in 1994 or 2001. The period between the 1986 interview and the 1989 interview is a long enough interval to expect that health effects of perceived insecurity might be noticeable, without being so lengthy that effects might dissipate as other life conditions change.

Two health measures are used to examine whether our measure of perceived job insecurity has similar effects across outcomes: self rated health and depressive symptoms. In 1986 and 1989 respondents were asked to rate their overall health with the typical five category item for self rated health, with values ranging from 1 = excellent to 5 = poor. As shown in Table 1, average self rated health in 1989 was significantly higher for respondents who perceived job insecurity in 1986 and/or 1989 than for those who did not report insecurity at either wave. Depressive symptoms are measured using an 11-item subset of the Center for Epidemiological Studies Depression Scale or CES-D (Radloff 1977), the version collected in the ACL survey. Kohout and colleagues (1993) have demonstrated that this subset has similar reliability when compared to the full CES-D scale. Responses to each item are scored on a four-item Likert scale, standardized scores of all available items are averaged and the score is then standardized based on the mean and standard deviation of the total 1986 ACL sample, with a final range from -1.1

(least) to 4.0 (most depressed).[6] There are statistically significant differences in the depressive symptoms, with symptoms lowest among those who were never insecure, second lowest for those who only recently reported job insecurity, next highest for those who were insecure at the first interview but currently report that their job is secure, and highest among those who were insecure at both waves.

Other Predictors

In the multivariate analyses we adjust for a variety of characteristics related to health and perceived job insecurity, including sociodemographic characteristics, job characteristics, and negative life events or "shocks" that occurred in the few years before the baseline interview or between 1986 and 1989. We control for the sex (0 = female, 1 = male) of the respondent because the traditional social role for men has been paid employment, potentially making job insecurity more threatening and entailing a greater impact on men's health than on women's. We also adjust for the respondent's age in 1986, expecting that perceptions about the risk of job loss and potential success in reemployment may vary over the career, but we find no significant difference in age or sex composition by category of insecurity.[7] Respondent's race is coded as 0 = non-Black or 1 = Black, because African Americans typically have been disadvantaged in

[6] Standardizing is performed at each wave based on the distribution for the entire sample at baseline, so that comparison of scores for the same individuals across waves of the survey is not compromised by sample attrition or mortality.

[7] We "center" age for the multivariate analysis, by subtracting the sample mean age, to obtain a measure that denotes the difference from the average respondent's age in that year. This aids in interpretation because a one unit change reflects a year older or younger than the average respondent.

labor market opportunities and this could lead to differential exposure to uncertainty about the stability of employment.[8] Blacks appear to be overrepresented among those reporting job insecurity, though the difference is significant only at the $p<.10$ level. Marital status may influence the level of available financial or social support available if the respondent feels uncertainty about his or her employment stability, or it could increase the anxiety produced by the experience if respondents feel responsible for supporting a family. Marital status in 1986 is coded so that 0 = married and 1 = unmarried. Finally, educational attainment at baseline is a strong indicator both of social background conditions and opportunities in the labor market, and for this analysis is coded as 0 = some college or more and 1 = high school graduate or less. Those who fear job loss are significantly more likely to have a high school education or less, compared to their secure counterparts.

To address the possibility that people in poorer health are more likely to feel job insecurity, we control for baseline measures of the health outcomes under study. Self-rated health in 1986 is significantly worse for individuals who are insecure about job loss or about finding a job, particularly for those who were insecure in 1986 but not in 1989. Depressive symptoms were also significantly higher in 1986 for respondents worried about losing a job. As discussed above, negative affectivity could be an important alternative explanation for a relationship between perceived job insecurity and subsequent health. We control for this personality characteristic using a neuroticism index based on several questions from the Eysenck Personality Inventory (Eysenck and Eysenck 1975). The neuroticism index is based on four

[8] There were not enough respondents of other racial/ethnic backgrounds to construct additional race categories for the analysis; the ACL was constructed to represent the 1986 United States population, when the proportions of other racial/ethnic minority groups were lower than today.

questions, such as "Are you a worrier?" and has a range from -1.2 (least neurotic) to 2.2 (most neurotic). Neuroticism index values are significantly higher for those who are worried about job loss.

As noted above, sociological research has suggested that while "good jobs" may have positive effects on workers, that "bad jobs" could have negative effects. We include here several key job characteristics to measure some aspects of job quality that could explain a relationship between perceived job insecurity (a "bad" job characteristic for many workers) and health. Respondent's annual earnings in 1986 (reported in Table 1 in 2005 dollars, but transformed to the started log for multivariate analysis) are highest among respondents who never reported insecurity, next highest for those who were insecure at both waves, and lower among those who were insecure at only one wave, particularly those who recently became insecure.[9] Class of occupation is also an indicator of job quality and may influence perceptions of job insecurity. Some studies have observed that white and blue-collar workers face distinct threats of job loss and reemployment, and may respond differently to these threats (Farber 2003; Hammermesh 1989; Kletzer 1989). Class of occupation is coded so that 0 = white-collar (professional and technical workers, managers and administrators (except farm), and sales and clerical workers) and 1 = blue collar workers (craftsmen and kindred workers, operatives, laborers, farmers and farm managers, and service workers). Blue collar employees are significantly overrepresented among those reporting insecurity about losing their job. Employment security and other conditions may differ based on employment sector; here we distinguish individuals reporting that

[9] In the started log transformation, a small positive constant ($500) is added to each respondent's annual earnings before taking the log, so that individuals with a score of zero on the measure are retained.

they worked for a public employer in 1986 from others, and find that those who recently reported insecurity or were insecure in 1986 and 1989 may be less likely than others to work for a public employer, though the difference is significant only at the $p<.10$ level. A final measure of job conditions is the respondent's report of satisfaction with the job in 1986, a measure which ranges from 1 = completely satisfied to 5 = not at all satisfied. Workers reporting job insecurity are significantly less satisfied with their jobs than those who did not report insecurity.

Finally, we consider the importance of 'shocks' as an influence on reports of perceived insecurity or as a potential explanation for a relationship between perceived insecurity and health. We focus here on involuntary job losses and serious or life-threatening health events that occurred between 1983 and the 1986 interview ("early shocks") or between the 1986 and 1989 interviews ("intermediate shocks").[10] Respondents who experienced an involuntary job loss between 1983 and 1986 were significantly more likely to report perceived job insecurity in 1986, and those who involuntarily lost a job between 1986 and 1989 were significantly more likely to change their report of job insecurity between the first and second wave. There were not, however, significant differences in the frequency of early or intermediate period health shocks across insecurity categories.

[10] Involuntary job losses were coded based on the self report of respondents, all of whom were asked whether they had "an involuntarily job loss for reasons other than retirement" since the last wave of the survey, or in the last three years, in the baseline survey. The definition of a "serious" or "life-threatening" health event was left to the respondent, so there may be some variation in the objective severity of the event; however, in the present analysis we assume that any self-reported serious or life-threatening event could potentially impact an individual's subsequent reports of job insecurity or health.

In Appendix A, we compare the characteristics of respondents in our analytic sample with those who reported their perceived job insecurity at one of the first two waves but not the other, and who omitted from our analysis. We collapse the respondents in our analytic sample into a single category and compare them with respondents who were: (i) Secure in 1986, but not working in 1989, (ii) Insecure in 1986, but not working in 1989, (iii) Secure in 1986, but did not respond to the survey in 1989, (iv) Insecure in 1986, but did not respond to the survey in 1989, (v) Not working in 1986, secure in 1989, and (vi) Not working in1986, insecure in 1989. The comparisons in Appendix A indicate that in general, the respondents who reported on perceived insecurity at only one wave had characteristics that put them at greater risk for negative health outcomes than the individuals in our analytic sample. Health outcomes in 1989 and health at baseline were poorer among those who reported about insecurity at only one wave, and sociodemographic characteristics also indicated higher risk: greater proportions were Black, unmarried, and had a high school education or less. Respondents in the analytic sample also tended to earn higher incomes, were less likely to work in blue collar jobs, and were more likely to work for a public employer than those who only reported about perceived insecurity at one survey wave. The frequency of involuntary job loss was higher among those excluded from our analysis than among those in the analytic sample, substantially so in some cases. These comparisons indicate that our analytic sample is healthier and at relatively lower risk for health decline over the 1986 to 1989 period than those respondents who reported about perceived job insecurity on only one occasion, so our results are likely to be a conservative estimate of any underlying true relationship between perceived job insecurity and health.

MULTIVARIATE RESULTS

Does perceived job insecurity predict health? Is the relationship robust to adjustment for characteristics that predict insecurity?

We turn now to multivariate models of the relationship between perceived job insecurity and self rated health and depressive symptoms, controlling progressively for predictors of job insecurity. Results are presented in Table 2 for self reported health and Table 3 for depressive symptoms, with coefficients representing the estimated difference in health outcomes associated with a unit change in the predictor. We present R^2 statistics and Wald tests at the bottom of each table for comparison of nested models. Model 1 is our baseline model, estimating the impact of perceived job insecurity in 1986 and 1989 on health in 1989, adjusting for sociodemographic characteristics in 1986. The results from Model 1 show that respondents who were chronically insecure about job loss had significantly worse self rated health (β: 0.453) and greater depressive symptoms (β: 0.524) than respondents who were secure at both waves. In addition, respondents who were insecure in 1986 but became secure by 1989 had greater depressive symptoms (β: 0.275) than those who were never insecure. Other predictors behave in the expected ways; age is significantly positively associated with poorer self rated health and negatively associated with depressive symptoms, and black respondents and those with a high school education or less have higher depressive symptom scores.

Model 2 adjusts for baseline health and neuroticism, and the results show that the estimated impact of perceived job insecurity is reduced, reflecting the poorer average baseline health and greater neuroticism scores of respondents who felt insecure at work. The estimated impact of chronic perceived insecurity on self-rated health is reduced by about 12% and the impact on depressive symptoms is reduced by about 25%, but the differences remain statistically

significant. Once we adjust for baseline health and neuroticism score, however, respondents who were insecure in 1986 but not in 1989 no longer have significantly higher depressive symptoms scores than respondents who never reported job insecurity. Controlling for baseline health and neuroticism substantially reduces the estimated impact of age, race, and educational attainment on health outcomes in 1989. Not surprisingly, self rated health and depressive symptoms in 1986 are very strong predictors of these outcomes in 1989. The respondent's neuroticism score in 1986 is a strong and significant predictor of depressive symptoms at follow up but is not as strongly associated with self rated health. The variance explained by Model 2 is a substantial improvement over Model 1 for both outcomes.

With Model 3 we adjust for job characteristics that could explain the relationship we observe between perceived job insecurity and health, if job insecurity is merely one indicator of job quality and higher quality jobs are what determine better health outcomes. The estimated impact of chronic job insecurity on self rated health is reduced by about 10% and the impact on depressive symptoms is reduced by about 7% when we account for differences in job characteristics, but the differences are still statistically significant for both health outcomes. Public employees have significantly better self rated health than their private employee counterparts, net of all else in Model 3, and annual earnings are significantly negatively related to depressive symptoms, but the addition of controls for job characteristics does not change the substantive effects of other predictors.

Is the relationship between job insecurity and health explained by actual job losses or health events?

Next, we assess the impact of involuntary job losses and health shocks; such negative life events may explain the relationship we find between perceived job insecurity and health outcomes. In

Model 4 we adjust for events that occurred between 1983 and 1986, as these shocks may have determined respondents' reports of perceived insecurity in 1986. The results show that these predictors do not have independent effects and do not change the estimated effect of chronic job security on health in 1989 by more than 2% for either health outcome. With Model 5 we introduce measures of negative life events that occurred between 1986 and 1989, and that may have influenced change in an individual's report about job insecurity. We find that involuntary job losses do not appear to have an independent effect, but health shocks have a substantial negative impact on both health outcomes, and adjusting for these shocks reduces the estimated impact of chronic job insecurity by 2 to 4%. The fact that involuntary job losses don't exercise a negative effect on health outcomes appears at first unexpected, but may be explained by our selection of the analytic sample. We consider only respondents who were employed both in 1986 and 1989 – this means that respondents who lost a job between 1983 and 1986 but were not employed by baseline, as well as those who lost a job after the 1986 interview but were not reemployed by 1989 are not included in our analytic sample. As shown in Appendix A, respondents who were working only in one survey wave generally had significantly poorer health in both 1986 and 1989, so omitting these respondents means that those suffering the most negative health consequences (or causes) of involuntary job loss are probably omitted from our analysis.

Overall, the findings of Model 5 suggest that even after we allow for some of the natural mechanisms through which job insecurity could exert its effects, chronic perceived job insecurity is associated with substantially poorer health. Furthermore, the size of the estimated difference between chronically insecure respondents and those who were never insecure is substantial even after the adjustment. The estimated difference in self rated health associated with chronic

insecurity is slightly larger than the difference associated with a serious or life threatening health shock in the past three years; for depressive symptoms, the difference associated with chronic insecurity is more than twice as large as the difference associated with a health shock.

To clarify these findings, in Figures 1 and 2 we present predicted health outcomes based on estimates from Model 5 and under two scenarios, one "positive" (more than a high school education, white collar job, public employee, and no health shock between 1986 and 1989) and the other more "negative" (high school education or less, blue collar job, private employee, and experienced a health shock between 1986 and 1989). Both the "positive" and "negative" predicted scenarios adjust age, baseline health and neuroticism, annual earnings, and job satisfaction to the mean values for the entire analytic sample, and leave sex, race, marital status and experience of an involuntary job loss between 1986 and 1989 at the values reported by the respondent. Figure 1 compares the unadjusted estimate of self rated health in 1989 (from Table 1) with the predicted values based on these positive and negative scenarios (based on Model 5). Under the positive scenario predicted self rated health is better than observed outcomes, particularly for respondents who were insecure in 1986 and secure in 1989, and for those who were insecure at both waves, suggesting that our measured characteristics capture some of the differences between those who were worried about job loss in 1986 and those who were not worried at that interview. Complementing this finding, under the negative scenario all respondents would be worse off, particularly those who were secure in 1986. Overall, the predicted scenarios demonstrate that even after our adjustments, chronic exposure is associated with the poorest self rated health while those who were never insecure have the best outcomes; those recently becoming insecure appearing to be slightly worse off than those who felt insecure three years ago but were recently secure.

Figure 2 shows the same estimates for depressive symptoms. Under the positive scenario depressive symptoms are lower than the observed values among those who were insecure in 1986, while under the negative scenario, depressive symptoms are greater for everyone, particularly those who were secure at baseline. As for self rated health, this reflects the differences those who were and were not worried about job loss in 1986 in the characteristics we measured at that wave. Under both scenarios, we continue to find a strong disadvantage for those who were chronically insecure, and the best outcomes among those who never reported insecurity.

Is the relationship between perceived job insecurity and health the same for all workers? The final portion of the analysis explores the possibility that our findings for the analytic sample as a whole may obscure important differences in the consequences of job insecurity across population subgroups. We tested for interactions between our categorical measure of perceived insecurity in 1986 and 1989 and key predictor variables, as shown in Appendices B and C. Appendix B presents the estimated main effects of job insecurity categories on self rated health, as well as presenting the interaction terms for these categories for the predictor that heads each column. For example, in the second column of Appendix B, the estimated main effects of job insecurity categories reflect the effects for women, while the interaction terms (with sex=male) reflect the estimated effects for men. Similarly, we show the interaction terms with age (under versus over 50 years at baseline), race (non-black versus black), educational attainment (more than high school versus high school or less), annual earnings (above versus below the mean at baseline), occupational group (white versus blue collar), employment sector (private versus public employee), experience of involuntary job loss or negative health shock between 1986 and 1989 (no versus yes). Appendix C presents the same figures for depressive symptoms. These

interaction models contain the same predictors as included in Model 2 in Tables 2 and 3, as well as including the indicators for negative life events between 1986 and 1989 (involuntary job loss and health shock).

The interaction models suggest several important subgroup differences in the impact of perceived job insecurity on health. In models of self rated health, we observe a significant interaction between perceived job insecurity and employment sector, as demonstrated in Figure 3; for individuals who recently became insecure or have been chronically insecure, self rated health outcomes are considerably worse for those in private as compared to public employment. In models of depressive symptoms, there are significant differences in the impact of perceived insecurity by race and recent involuntary job loss. Figure 4 shows that black respondents have greater depressive symptoms across perceived insecurity categories, but for the chronically insecure, their outcomes are substantially worse. The effects of an involuntary job loss between 1986 and 1989 in combination with perceived insecurity are shown in Figure 5, which suggests that the salutary effects of moving from a state of insecurity to security are driven largely by actual job losses among the respondents in this category, and that chronically insecure respondents who experienced an involuntary job loss between measures of insecurity are less depressed than those who haven't had a job loss in this period. In these cases, job losses may provide the opportunity for a change in position that improves or at least alters working conditions (at least in the short term). On the other hand, it's possible that the respondents who lost jobs after 1986 and weren't reemployed by 1989 (and thus were not included in our analytic sample) were more likely to have relatively high depressive symptoms at baseline. Some combination of these forces probably accounts our findings.

DISCUSSION

This study set out to examine the relationship between perceived job insecurity and health among workers in the United States. We sought to answer three research questions; first, does perceived job insecurity predict health, and is the relationship robust to adjustment for characteristics that predict insecurity? We found that chronic job insecurity, as measured here on two occasions three years apart, is associated with significantly poorer self rated health and greater depressive symptoms. This finding holds when we adjust models for the substantial differences in the sociodemographic characteristics of respondents who reported different 'histories' of perceived job insecurity, including their health differences at baseline. Our results strengthen existing findings for poorer health among those who report fears about job loss that have been based on cross-sectional data or on firm-specific or industry specific samples. Second, we asked whether the relationship between job insecurity and health are simply a function of actual job losses or health events that may be predicted by perceived job insecurity. We examined the impact of involuntary job losses and acute negative health events as possible predictors of baseline job insecurity or of changes in perceived insecurity between 1983 and 1989. Even with these adjustments, our main findings hold; chronic perceived job insecurity is significantly associated with poorer health on both measures. We have not found other studies of perceived job insecurity that adjusted for actual job losses or other negative life events, making this finding a unique contribution. Our final research question asked whether the relationship between perceived job insecurity and health is the same for all workers, and we found some differences across subpopulations. In particular, public employment appeared to be somewhat protective relative to private employment for self rated health outcomes, while black race intensified the effects of chronic insecurity on depressive symptoms. We also found that actual involuntary job losses

actually reduced the measured impact of chronic insecurity and past insecurity, but suspect that our selection into the analytic sample of only those who were working again by 1989 may reflect the outcomes only for those who are most successful at a return to employment.

Our results are also robust to adjustment for respondents' measured negative affectivity at baseline, suggesting that underlying personality differences are unlikely to account for our findings. Our measures of job 'quality' help to explain a small portion of the relationship between perceived job insecurity and health, but the measures used here differ considerably from those used by others who have examined contemporary 'bad jobs' (Kalleberg, Reskin and Hudson 2000). We do not find strong support for heightened consequences of perceived job insecurity among people in "good" or "bad" jobs; there is no significant interaction between perceived insecurity and the earnings associated with the job or with job dissatisfaction (results not shown), though people in public employment (which might be considered a "good" job characteristic) are better off than their counterparts in private employment under conditions of insecurity. Future work with larger samples should examine job quality more carefully than was possible here.

This study suffers some weaknesses, and perhaps the most obvious is the age of the data considered here. These measures of perceived job insecurity were collected in the mid-to-late 1980s, and employment conditions have changed considerably since then. It is reasonable to ask whether these findings are still relevant to today's labor market conditions. Other studies have argued that workers' sense of job insecurity has changed since the mid-1980s, both in response to the business cycle, as is typically the case, and in other ways that are unique to the last two decades. Using data from the General Social Survey (GSS), studies have found that at least some concern about the possibility of losing their job had begun to affect a larger and more diverse

fraction of the population over the period from the late 1970s through the mid-1990s (Aaronson and Sullivan 1998; Schmidt 1999). The GSS is a series of cross-sectional samples that cannot be used to examine the prospective relationships between perceived insecurity and health, but these findings suggest that perceived insecurity is not disappearing, and if anything is affecting a broader swatch of the population now than at the time the data used here were gathered. Furthermore, longitudinal data that collect repeated measures of perceived insecurity, health and other life events are relatively rare, making this analysis a contribution to the literature despite the age of the data.

Another potential shortcoming is our inability to control fully for unobserved heterogeneity across individuals in the models used here. It may be the case that unmeasured characteristics of individuals, in particular their underlying health, account for both their reports of perceived insecurity and their health progression as they age. We considered using fixed effects regression models that would account for all unmeasured characteristics at the individual level, but there is one major difficulty with using such models in the present analysis. We were interested in the potential negative consequences of perceived job insecurity over time, and chronic insecurity was predicted to have the most negative health consequences. In a fixed-effects modeling framework, it is not possible to estimate the effect of an exposure that does not change over time for a given individual. As we found in this analysis, it is chronic insecurity that shows a measurable negative relationship with health, and this is an effect that we are unable to measure under a fixed-effects specification. We also estimated our models using only those respondents who reported excellent or very good self-rated health at baseline to reduce the potential that health selection drives our results, and found no substantive differences (results available from authors). Finally, our control for health shocks was one way to adjust for the

possibility that health decline caused people to report feeling insecure about keeping their job, but health shocks may capture only acute events, not less severe declines in health. In sum, the potential for unobserved heterogeneity is still a relevant consideration when interpreting these findings, though we have attempted to test the sensitivity of our findings to such influences.

Finally, our measure of job insecurity 'histories' overlaps with our health outcome measures in 1989, so our design is not fully prospective. It is possible to observe health in 1994 and 2001 in the ACL, but we chose to limit our analysis to the 1986 to 1989 period because we cannot control for changes in perceived insecurity between 1989 and the later survey waves. In addition, the time periods between survey waves lengthen progressively so that we would be observing health after about five to ten years after our last measure of perceived job insecurity. In exploratory analyses not reported here, we found that having a history of perceived job insecurity was still significantly associated with greater depressive symptoms in 1994, while it was not associated with significantly more decline in self rated health. These exploratory findings are consistent with other studies that have shown a more robust effect of perceived insecurity on psychological health than on other measures of health status, but we feel it may be premature to interpret these findings in the absence of information on change or stability in perceived inequality between 1989 and 1994.

Future studies would be strengthened by exploring more objective measures of health, particularly physical health. In addition, unexplored aspects of the perceived job insecurity-health relationship deserve greater attention. Aggregate-level conditions, such as the vibrancy of the local labor market, may also influence the perception or consequences of job insecurity. For example, it may be important to distinguish between individuals in a locally declining industry, such as manufacturing, who don't associate their job insecurity with personal incompetence,

from those who does blame themselves for their job insecurity, perhaps in an industry that is not experiencing downsizing (Heaney, Israel and House 1994; Newman 1988).

Nonetheless, we argue that the findings of this study make a valuable contribution to the existing literature on job security and health. These results are unique in assessing the impact of perceived job insecurity in a representative sample of men and women across the occupational spectrum of the United States. The majority of the existing studies of job insecurity and health have been conducted in Western European countries, where protections for workers and accommodations for those who are displaced are more generous than they are in the United States. Studies of workers in the United States have generally used restricted samples based on a single plant (Heaney, Israel and House 1994) or a particular occupational group (Amick et al. 1998), so there is little information about the impact of perceived job insecurity on health in the population overall, or across age, gender, racial/ethnic, or socioeconomic groups. Furthermore, these results could be considered conservative because of the restrictions we imposed on the analytic sample. As is clear from a perusal of Appendix A, the respondents we omitted from our study have poorer health profiles than the relatively healthy and socioeconomically privileged respondents we analyzed, and their inclusion might have strengthened our estimates of the impact of perceived job insecurity.

Job insecurity is not a new phenomenon, and sociologists have been concerned with its consequences at least since Marx described a "reserve army of labor" whose low wages and unstable employment opportunities instilled fear of job loss in other workers (McDonough 2000). However, as increased "flexibility" in the labor market leaves increasing numbers of workers at all levels of the occupational hierarchy with concerns about the future of their positions, and the potential consequences of job loss appear continue to be substantial, job

insecurity will only grow as a potentially potent risk to population health. Furthermore, policymakers may want to attend to differences in the likely consequences for some groups of workers, such as black workers and those in the private sector.

Appendix A. Descriptive Characteristics of Analytic Versus those Not Included in the Analytic Sample, by Insecurity History 1986-1989.

		Not Included in Analysis						
	Analytic Sample	Secure 1986, Left work 1989	Insecure 1986, Left work 1989	Secure 1986, Non-response 1989	Insecure 1986, Non-response 1989	Didn't work 1986, Secure 1989	Didn't work 1986, Insecure 1989	p for diff.
Health Outcomes								
Self Rated Health 1989	2.21	2.28	2.70	na	na	2.38	2.19	0.002
	(0.853)	(1.16)	(1.16)			(0.855)	(0.852)	
Depressive Symptoms 1989	-0.187	-0.044	0.334	na	na	0.055	0.150	0.005
	(0.895)	(1.16)	(1.19)			(1.08)	(0.990)	
Sociodemographic Characteristics								
% Male	55.5	31.5	52.6	65.2	59.3	14.5	10.4	<.001
Age in 1986	38.4	41.4	43.2	38.8	35.6	35.5	38.0	<.001
	(9.00)	(11.4)	(13.0)	(9.42)	(9.56)	(7.63)	(9.12)	
% Black	10.1	11.1	10.2	16.2	20.7	13.6	8.81	<.001
% Unmarried 1986	26.9	27.9	51.1	31.3	33.7	18.6	33.2	0.006
% <=High School Education	43.8	61.6	71.9	58.6	64.6	46.4	77.7	<.001
Self-rated Health 1986	1.95	2.13	2.44	2.02	2.26	2.18	2.28	<.001
	(0.848)	(0.965)	(1.20)	(0.991)	(1.12)	(0.797)	(0.930)	
Depressive Symptoms 1986	-0.097	-0.006	0.518	-0.038	0.501	0.187	0.456	<.001
	(0.944)	(1.06)	(1.12)	(0.959)	(1.05)	(1.12)	(1.22)	
Neuroticism scale 1986	-0.091	0.122	0.440	-0.090	0.380	0.249	0.502	<.001
	(0.933)	(1.06)	(0.990)	(1.04)	(1.05)	(0.937)	(1.11)	
Job Characteristics								
Annual earnings 1986	42,436	24,687	20,445	37,846	33,592	na	na	<.001
	(34,066)	(23,390)	(24,342)	(23,534)	(26,149)			
% Blue collar worker 1986	37.2	45.3	70.1	49.2	60.5	na	na	<.001
% Public employee 1986	34.5	33.4	26.4	34.8	14.6	na	na	0.779
Dissatisfaction with work 1986	2.15	2.30	2.74	1.99	2.29	na	na	0.003
	(0.918)	(1.02)	(1.13)	(1.03)	(1.02)			
Early Shocks								
Job Loss 1983-1986	9.05	10.1	25.4	7.11	30.0	21.6	23.2	<.001
Health Shock 1983-1986	16.3	25.2	14.0	12.9	29.2	15.8	20.0	0.112

(Appendix A continued below.)

Appendix A, continued. Descriptive Characteristics of Analytic Versus those Not Included in the Analytic Sample, by Insecurity History 1986-1989.

		Not Included in Analysis						
	Analytic Sample	Secure 1986, Left work 1989	Insecure 1986, Left work 1989	Secure 1986, Non-response 1989	Insecure 1986, Non-response 1989	Didn't work 1986, Secure 1989	Didn't work 1986, Insecure 1989	p for diff.
Intermediate Shocks								
Job Loss 1986-1989	7.13	24.8	36.5	na	na	1.85	19.5	<.001
Health Shock 1986-1989	19.0	26.0	35.1	na	na	25.4	17.4	0.058
N	1111	83	23	208	55	82	32	

Note: Tests for difference across categories of insecurity history were chi-square tests for categorical predictor variables and Kruskall-Wallis tests for continuous variables.

Appendix B. Unstandardized Regression Coefficients from Linear Regression Interaction Models of Self Rated Health.

	Male	Over 50 Years at Baseline	Black	High School or Less	< Mean Annual Earnings	Blue Collar	Public Employee	Involuntary Job Loss 1986-89	Health Shock 1986-89
Main Effect of Predictor	-0.039	0.052	0.028	-0.017	0.035	0.062	-0.079	0.014	0.292**
	(0.057)	(0.087)	(0.072)	(0.061)	(0.061)	(0.063)	(0.059)	(0.153)	(0.087)
Effects of Perceived Insecurity									
Became Secure	-0.053	0.055	0.055	-0.032	0.094	-0.029	0.069	0.047	0.029
	(0.126)	(0.096)	(0.097)	(0.117)	(0.131)	(0.121)	(0.121)	(0.095)	(0.101)
Became Insecure	0.219†	0.169†	0.145	0.118	0.095	0.102	0.258**	0.160†	0.156†
	(0.131)	(0.090)	(0.094)	(0.101)	(0.110)	(0.107)	(0.097)	(0.093)	(0.091)
Stayed Insecure	0.197	0.326**	0.372**	0.538***	0.457**	0.428**	0.416**	0.370**	0.399***
	(0.180)	(0.121)	(0.120)	(0.136)	(0.143)	(0.126)	(0.123)	(0.114)	(0.104)
Interaction Terms									
Became Secure	0.166	-0.016	-0.040	0.171	-0.091	0.154	-0.043	0.027	0.092
	(0.172)	(0.235)	(0.198)	(0.178)	(0.176)	(0.178)	(0.170)	(0.281)	(0.208)
Became Insecure	-0.135	-0.134	0.051	0.064	0.092	0.107	-0.393*	-0.060	-0.036
	(0.168)	(0.282)	(0.169)	(0.162)	(0.164)	(0.168)	(0.177)	(0.218)	(0.232)
Stayed Insecure	0.262	0.266	0.043	-0.270	-0.175	-0.100	-0.261	0.084	-0.080
	(0.223)	(0.257)	(0.225)	(0.202)	(0.212)	(0.212)	(0.223)	(0.332)	(0.300)
R^2	0.331	0.328	0.329	0.331	0.330	0.332	0.337	0.329	0.329

Note: Standard errors of estimates are in parentheses, and significance levels are denoted by * p < .05, ** p < .01, *** p < .001. All models include controls for sex, age, race, marital status, educational attainment, baseline health, neuroticism, involuntary job loss betwee 1986-1989, and health shock between 1986-1989.

Appendix C. Unstandardized Regression Coefficients from Linear Regression Interaction Models of Depressive Symptoms.

	Male	Over 50 Years at Baseline	Black	High School or Less	< Mean Annual Earnings	Blue Collar	Public Employee	Involuntary Job Loss 1986-89	Health Shock 1986-89
Main Effect of Predictor	0.030	-0.066	0.113	0.111	0.175**	0.127	-0.034	0.316	0.120
	(0.063)	(0.084)	(0.070)	(0.066)	(0.066)	(0.073)	(0.066)	(0.189)	(0.087)
Effects of Perceived Insecurity									
Became Secure	0.158	0.048	0.057	0.117	-0.032	0.165	0.033	0.170†	0.005
	(0.145)	(0.095)	(0.099)	(0.124)	(0.124)	(0.133)	(0.113)	(0.092)	(0.095)
Became Insecure	0.095	0.080	0.055	0.030	-0.025	0.031	0.104	0.015	0.063
	(0.150)	(0.096)	(0.097)	(0.102)	(0.085)	(0.100)	(0.104)	(0.094)	(0.091)
Stayed Insecure	0.485**	0.351**	0.295*	0.363*	0.540**	0.542***	0.360**	0.425**	0.382**
	(0.181)	(0.135)	(0.128)	(0.155)	(0.163)	(0.153)	(0.132)	(0.126)	(0.132)
Interaction Terms									
Became Secure	-0.126	0.304	0.226	-0.075	0.179	-0.192	0.129	-0.747*	0.326
	(0.185)	(0.262)	(0.192)	(0.183)	(0.173)	(0.184)	(0.186)	(0.304)	(0.231)
Became Insecure	-0.060	-0.183	0.080	0.052	0.121	0.049	-0.164	0.178	-0.034
	(0.173)	(0.196)	(0.174)	(0.161)	(0.154)	(0.171)	(0.177)	(0.243)	(0.267)
Stayed Insecure	-0.162	0.112	0.589*	0.020	-0.379†	-0.351	0.052	-0.614*	-0.013
	(0.235)	(0.270)	(0.286)	(0.231)	(0.227)	(0.233)	(0.305)	(0.310)	(0.293)
R^2	0.284	0.285	0.286	0.284	0.296	0.288	0.285	0.294	0.286

Note: Standard errors of estimates are in parentheses, and significance levels are denoted by * p < .05, ** p < .01, *** p < .001. All models include controls for sex, age, race, marital status, educational attainment, baseline health, neuroticism, involuntary job loss betwee 1986-1989, and health shock between 1986-1989.

Table 1. Means or Percentages for Dependent and Independent Variables by Perceived Job Insecurity History.

	Secure in 1986 and 1989	Insecure in 1986, Secure in 1989	Secure in 1986, Insecure in 1989	Insecure in 1986 and 1989	p for diff.
Health Outcomes					
Self Rated Health 1989	2.14	2.37	2.31	2.60	<.001
	(0.810)	(1.01)	(0.810)	(0.929)	
Depressive Symptoms 1989	-0.271	0.062	-0.143	0.260	<.001
	(0.867)	(0.936)	(0.846)	(0.998)	
Sociodemographic Characteristics					
% Male	54.1	61.2	52.4	66.4	0.388
Age in 1986	38.3	38.0	38.9	40.5	0.863
	(9.03)	(8.71)	(8.59)	(9.66)	
% Black	9.45	10.7	11.8	14.1	0.096
% Unmarried 1986	25.7	35.9	22.5	30.4	0.233
% <=High School Education	40.3	49.1	56.9	56.2	0.001
Self-rated Health 1986	1.92	2.16	1.96	1.98	0.015
	(0.819)	(0.964)	(0.821)	(0.928)	
Depressive Symptoms 1986	-0.169	0.194	-0.075	0.151	<.001
	(0.926)	(1.02)	(0.964)	(0.807)	
Neuroticism scale 1986	-0.155	0.180	0.014	-0.024	0.002
	(0.919)	(0.961)	(0.879)	(1.01)	
Job Characteristics					
Annual earnings 1986	44,462	37,278	33,893	41,041	<.001
	(35,838)	(30,259)	(25,801)	(26,464)	
% Blue collar worker 1986	33.5	48.7	44.9	46.8	<.001
% Public employee 1986	36.3	34.9	28.9	19.5	0.090
Dissatisfaction with work 1986	2.08	2.46	2.17	2.36	0.023
	(0.880)	(1.06)	(0.929)	(0.899)	
Early Shocks					
Job Loss 1983-1986	6.70	13.0	16.2	19.1	<.001
Health Shock 1983-1986	16.6	21.1	7.48	16.3	0.844
Intermediate Shocks					
Job Loss 1986-1989	4.76	13.9	14.6	11.0	<.001
Health Shock 1986-1989	18.3	25.1	13.1	24.4	0.390
N	791	143	105	72	

Note: Standard errors associated with variable means presented in parentheses. Figures based on weighted data, except for column totals. Tests for difference across categories of insecurity history were chi-square tests for categorical predictor variables and Kruskall-Wallis tests for continuous variables.

Table 2. Unstandardized Regression Coefficients from Linear Regression Models of Self Rated Health in 1989.

	Model 1	Model 2	Model 3	Model 4	Model 5
Perceived Insecurity					
Became Secure	0.200	0.062	0.042	0.039	0.030
	(0.108)	(0.091)	(0.091)	(0.091)	(0.089)
Became Insecure	0.138	0.135	0.116	0.117	0.134
	(0.097)	(0.084)	(0.082)	(0.082)	(0.083)
Stayed Insecure	0.453***	0.399***	0.361**	0.354**	0.340**
	(0.123)	(0.104)	(0.105)	(0.106)	(0.108)
Sociodemographic Characteristics					
Male	-0.062	-0.030	-0.029	-0.034	-0.021
	(0.060)	(0.051)	(0.057)	(0.057)	(0.056)
Age in 1986	0.007*	0.005	0.006*	0.007*	0.007*
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Black	0.098	0.015	-0.003	0.008	0.010
	(0.073)	(0.062)	(0.064)	(0.064)	(0.062)
Unmarried 1986	-0.043	-0.011	-0.014	-0.022	-0.018
	(0.066)	(0.055)	(0.054)	(0.055)	(0.054)
<=High School Education	0.109	-0.008	-0.037	-0.035	-0.041
	(0.061)	(0.054)	(0.057)	(0.057)	(0.057)
Self-rated Health 1986	--	0.500***	0.498***	0.490***	0.480***
		(0.029)	(0.029)	(0.030)	(0.030)
Depressive Symptoms 1986	--	0.061	0.048	0.044	0.048
		(0.035)	(0.035)	(0.035)	(0.034)
Neuroticism scale 1986	--	0.057	0.059	0.060*	0.048
		(0.030)	(0.030)	(0.030)	(0.029)
Job Characteristics					
Annual earnings 1986	--	--	-0.016	-0.013	-0.016
			(0.034)	(0.034)	(0.033)
Blue collar worker 1986	--	--	0.050	0.047	0.071
			(0.058)	(0.058)	(0.058)
Public Employee 1986			-0.121*	-0.126*	-0.115*
			(0.052)	(0.052)	(0.052)
Dissatisfaction with work 1986	--	--	0.050	0.050	0.054
			(0.032)	(0.031)	(0.030)

(Table 2 continued below.)

Table 2, cont. Unstandardized Regression Coefficients from Linear Regression Models of Self Rated Health in 1989.

	Model 1	Model 2	Model 3	Model 4	Model 5
Early Shocks					
Job Loss 1983-1986	--	--	--	0.062	--
				(0.085)	
Health Shock 1983-1986	--	--	--	0.081	--
				(0.075)	
Intermediate Shocks					
Job Loss 1986-1989	--	--	--	--	-0.009
					(0.103)
Health Shock 1986-1989	--	--	--	--	0.305***
					(0.072)
Constant	2.19***	1.26***	1.39***	1.36***	1.34***
	(0.066)	(0.083)	(0.375)	(0.376)	(0.365)
N	1111	1111	1111	1111	1111
R^2	0.037	0.310	0.319	0.321	0.338
Wald tests for Comparison of Models					
Model 2 versus Model 1		123.0***			
Model 3 versus Model 2			2.47*		
Model 4 versus Model 3				0.890	
Model 5 versus Model 3					8.93***

Note: Standard errors of estimates are in parentheses, and significance levels are denoted by * $p < .05$, ** $p < .01$, *** $p < .001$.

Table 3. Unstandardized Regression Coefficients from Linear Regression Models of Depressive Symptoms in 1989.

	Model 1	Model 2	Model 3	Model 4	Model 5
Perceived Insecurity					
Became Secure	0.275*	0.096	0.059	0.057	0.045
	(0.107)	(0.091)	(0.092)	(0.092)	(0.091)
Became Insecure	0.104	0.063	0.033	0.032	0.035
	(0.104)	(0.085)	(0.082)	(0.083)	(0.084)
Stayed Insecure	0.524***	0.392**	0.363**	0.356**	0.348**
	(0.149)	(0.119)	(0.123)	(0.125)	(0.122)
Sociodemographic Characteristics					
Male	-0.091	-0.003	0.052	0.048	0.051
	(0.062)	(0.055)	(0.064)	(0.065)	(0.063)
Age in 1986	-0.007*	-0.003	-0.001	-0.001	0.000
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Black	0.260***	0.188**	0.160*	0.169**	0.167**
	(0.071)	(0.061)	(0.062)	(0.062)	(0.062)
Unmarried 1986	0.072	0.009	0.003	-0.004	-0.003
	(0.065)	(0.056)	(0.056)	(0.057)	(0.056)
<=High School Education	0.222**	0.107	0.052	0.054	0.050
	(0.065)	(0.056)	(0.063)	(0.063)	(0.063)
Self-rated Health 1986	--	0.069	0.068	0.062	0.059
		(0.035)	(0.035)	(0.036)	(0.035)
Depressive Symptoms 1986	--	0.302***	0.291***	0.289***	0.291***
		(0.039)	(0.040)	(0.041)	(0.040)
Neuroticism scale 1986	--	0.212***	0.215***	0.215***	0.208***
		(0.039)	(0.039)	(0.039)	(0.039)
Job Characteristics					
Annual earnings 1986	--	--	-0.109**	-0.106*	-0.105*
			(0.042)	(0.042)	(0.041)
Blue collar worker 1986	--	--	0.038	0.035	0.051
			(0.063)	(0.064)	(0.063)
Public Employee 1986			-0.029	-0.032	-0.020
			(0.057)	(0.057)	(0.057)
Dissatisfaction with work 1986	--	--	0.039	0.039	0.041
			(0.034)	(0.034)	(0.034)

(Table 3 continued below.)

Table 3. Unstandardized Regression Coefficients from Linear Regression Models of Depressive Symptoms in 1989.

	Model 1	Model 2	Model 3	Model 4	Model 5
Early Shocks					
Job Loss 1983-1986	--	--	--	0.064	--
				(0.095)	
Health Shock 1983-1986	--	--	--	0.057	--
				(0.092)	
Intermediate Shocks					
Job Loss 1986-1989	--	--	--	--	0.089
					(0.128)
Health Shock 1986-1989	--	--	--	--	0.175*
					(0.076)
Constant	-0.410***	-0.402***	0.668	0.642	0.606
	(0.065)	(0.096)	(0.444)	(0.446)	(0.436)
N	1111	1111	1111	1111	1111
R^2	0.061	0.277	0.286	0.287	0.293
Wald tests for Comparison of Models					
Model 2 versus Model 1		57.7***			
Model 3 versus Model 2			2.51*		
Model 4 versus Model 3				0.390	
Model 5 versus Model 3					3.32*

Note: Standard errors of estimates are in parentheses, and significance levels are denoted by * p < .05, ** p < .01, *** p < .001.

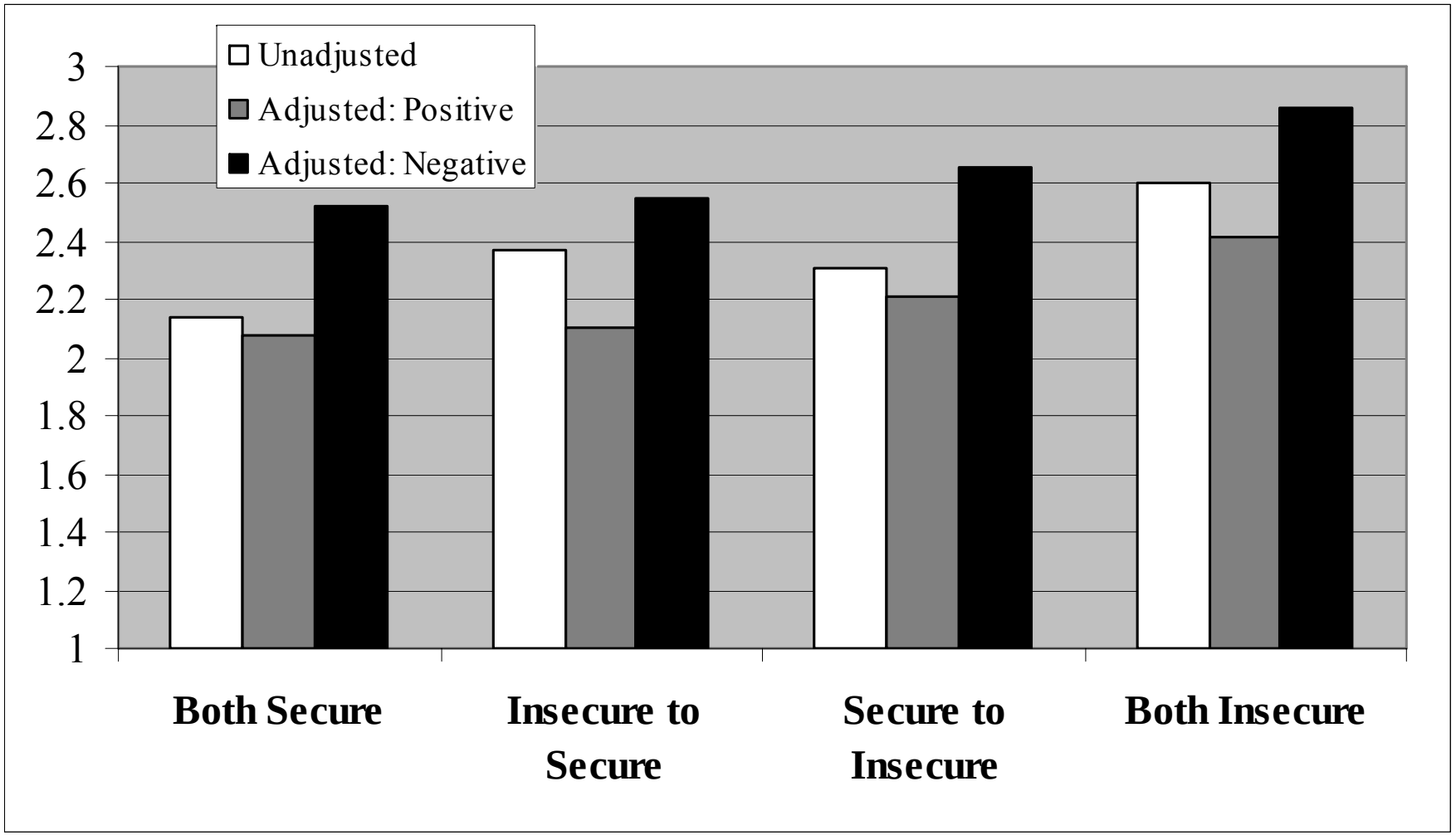

Figure 1. Unadjusted and Predicted Self Rated Health in 1989 by Perceived Insecurity History (positive and negative prediction scenarios described in text).

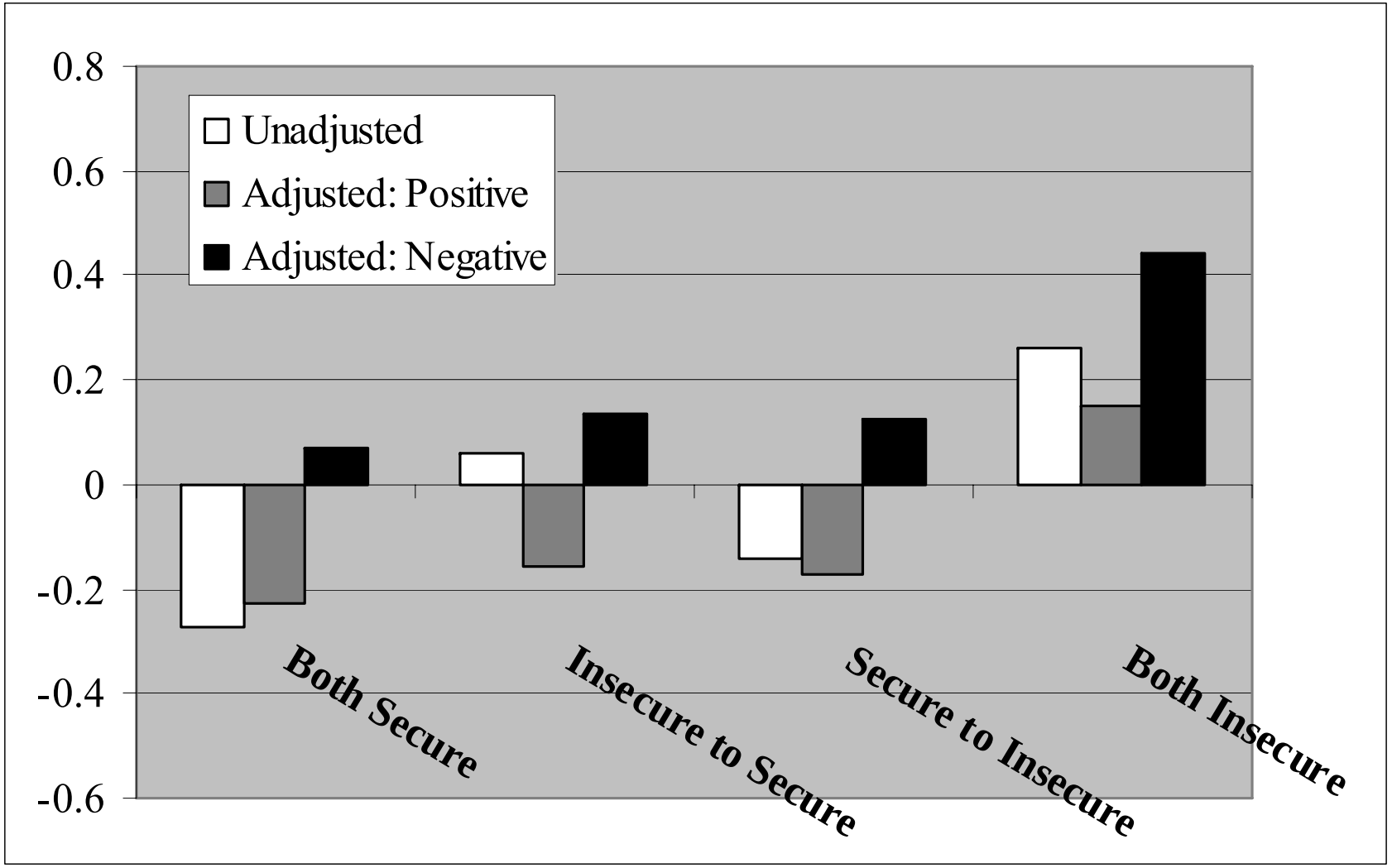

Figure 2. Unadjusted and Predicted Depressive Symptoms in 1989 by Perceived Insecurity History (positive and negative prediction scenarios described in text).

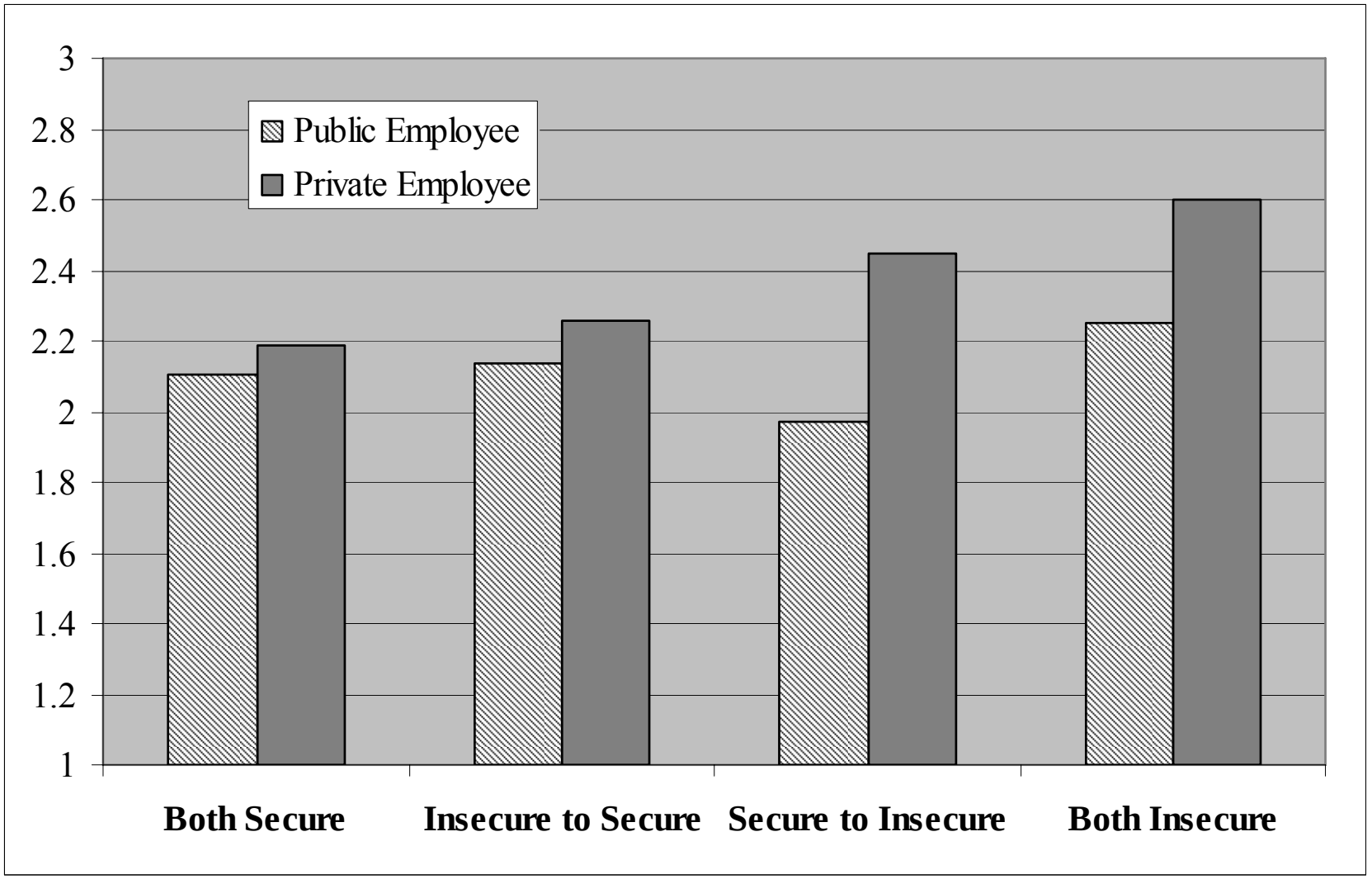

Figure 3. Predicted Self Rated Health in 1989 from Model including Interaction between Insecurity History and Employment Sector.

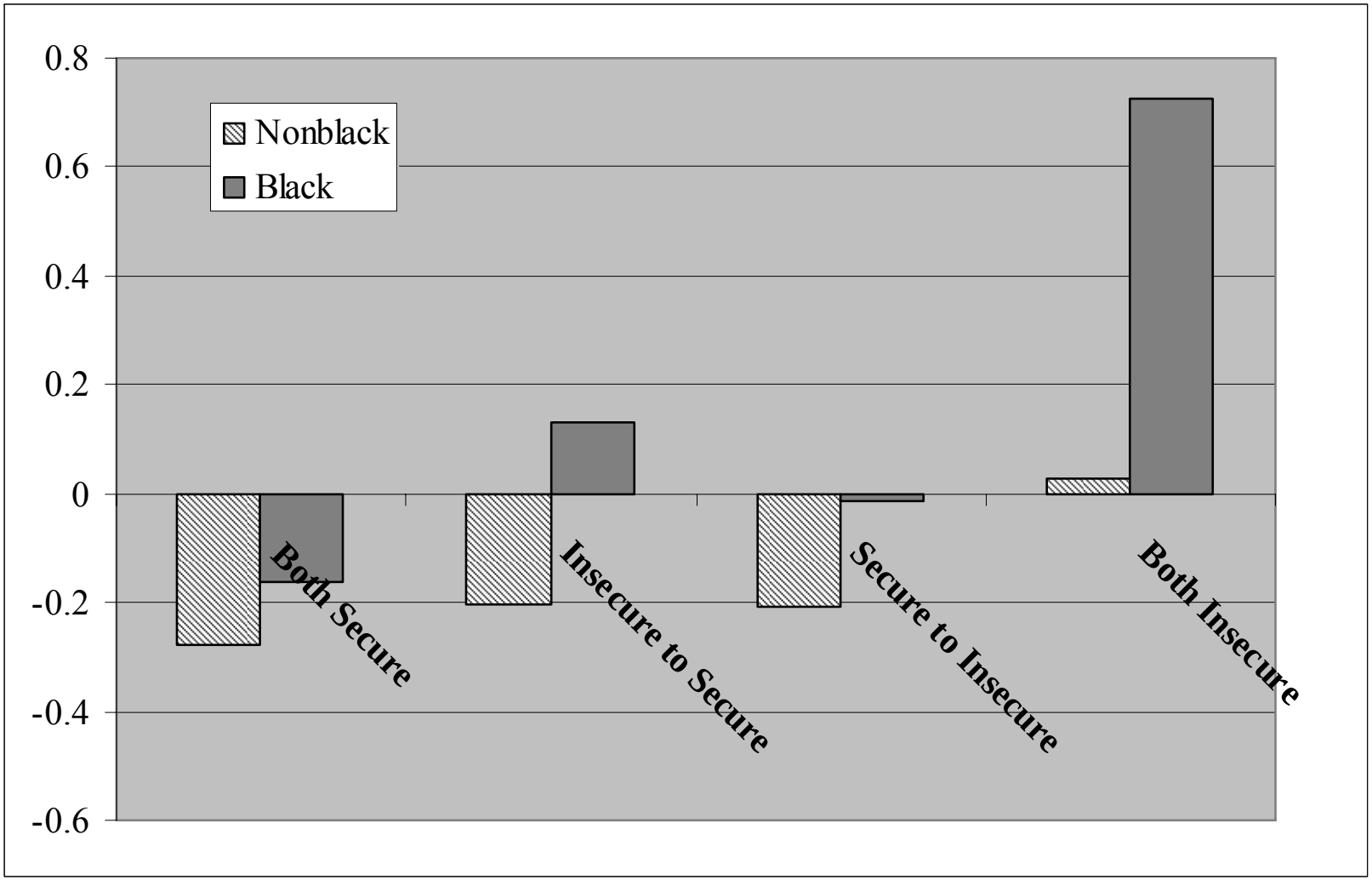

Figure 4. Predicted Depressive Symptoms in 1989 from Model including Interaction between Insecurity History and Race.

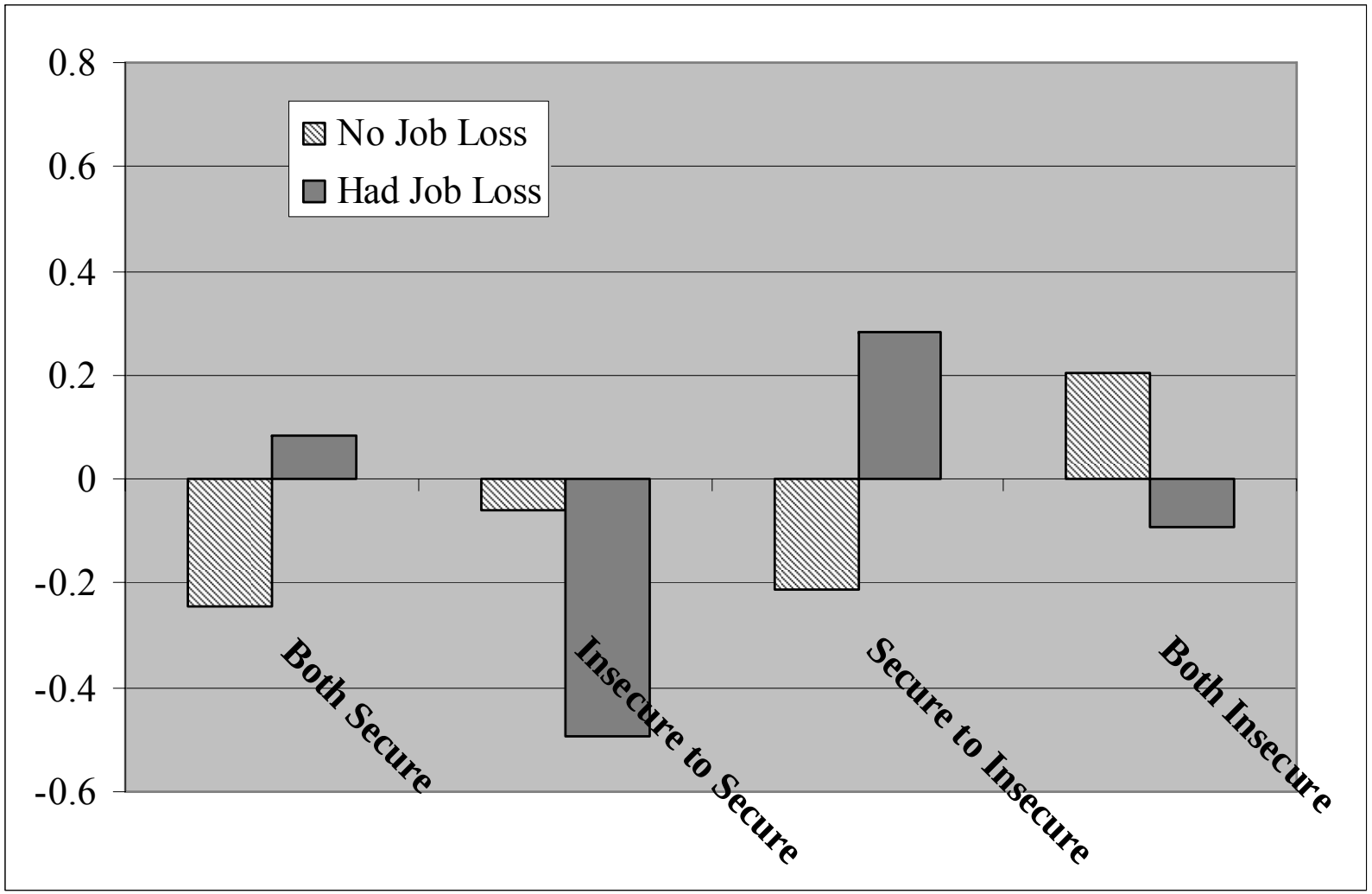

Figure 5. Predicted Depressive Symptoms in 1989 from Model including Interaction between Insecurity History and Involuntary Job Loss between 1986 and 1989.

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